

CLAIMS

1. A wireless-communication network system including a radio-base-station device, a mobile terminal, an authentication terminal, a controller having a function of generating and/or deleting user-authentication data of the mobile terminal, and a micro radio-base-station device which passes on data between the mobile terminal and a communication network,

wherein the controller determines whether or not a utilization request transmitted from the authentication terminal is accepted, and transmits the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal, and wherein;

when a user-authentication-data-reception-completion notification is transmitted from the mobile terminal, the controller transmits a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal and performs processing for charging a user a utilization fee.

2. The wireless-communication network system according to Claim 1, wherein the micro radio-base-station device receives position-registration-request data to which the user-authentication data is attached from the mobile terminal, compares the user-authentication data and terminal information that are included in the position-registration-request data with a database included in the controller, performs position registration when the user-authentication data and the terminal information agree with the database, and transmits a position-registration-completion notification to the mobile terminal and the controller, and wherein; radio communication is started between the mobile terminal which received the position-registration-completion notification and the micro radio-

base-station device.

3. The wireless-communication network system according to Claim 2, wherein the mobile terminal transmits utilization-finish-request data to the controller via the micro radio-base-station device, or the ordering terminal,

wherein the controller cancels the registered position of the mobile terminal which received the utilization-finish notification, invalidates the user-authentication data, and transmits a utilization-finish-procedure-completion notification to the mobile terminal via the micro-radio-base-station device and/or the ordering terminal,

wherein when the utilization fee is paid on time, the controller performs processing for charging the user the utilization fee, and transmits the utilization-finish-procedure-completion notification and utilization-fee-statement data to the mobile terminal, and

wherein the mobile terminal invalidates the user-authentication data and finishes communicating with a hot spot.

4. The wireless-communication network system according to any one of Claims 1 to 3, wherein the data transmission and/or reception is performed between the mobile terminal and the authentication terminal by using a communication scheme other than radio communication.

5. The wireless-communication network system according to Claim 4, wherein the communication scheme other than the radio communication is infrared communication and/or communication using an IC card.

6. A wireless-communication network system including a radio-base-station device, a mobile terminal, an authentication terminal, a controller having a

function of generating and/or deleting user-authentication data of the mobile terminal, and a micro radio-base-station device which passes on data between the mobile terminal and a communication network,

wherein the controller

determines whether or not a utilization request transmitted from the authentication terminal is accepted, and transmits the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal,

transmits encoded-information data used for radio communication performed between the micro-radio-base-station device and the mobile terminal to the mobile terminal upon receiving user-authentication-data-reception completion notification transmitted from the mobile terminal, and

transmits a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal and performs processing for charging a user a utilization fee upon receiving an encoded-information-reception-completion notification transmitted from the mobile terminal.

7. The wireless-communication network system according to Claim 6, wherein the micro radio-base-station device receives position-registration-request data transmitted from the mobile terminal, where the user-authentication data is attached to the position-registration-request data, compares the user-authentication data and terminal information that are included in the position-registration-request data with a database included in the controller, performs position registration when the user-authentication data and the terminal information agree with the database, and transmits a position-registration-completion notification to the mobile terminal and the controller, and

wherein radio communication is started between the mobile terminal

which received the position-registration-completion notification and the micro radio-base-station device on the basis of the encoded-information data.

8. The wireless-communication network system according to Claim 7, wherein the mobile terminal transmits utilization-finish-request data to the controller via the micro radio-base-station device, or the ordering terminal,

wherein the controller cancels the registered position of the mobile terminal which received the utilization-finish notification, invalidates the user-authentication data and the encoded-information data, and transmits a utilization-finish-procedure-completion notification to the mobile terminal via the micro radio-base-station device and/or the ordering terminal,

wherein when the utilization fee is paid on time, the controller performs processing for charging the user the utilization fee, and transmits the utilization-finish-procedure-completion notification and utilization-fee-statement data to the mobile terminal, and

wherein the mobile terminal invalidates the user-authentication data and the encoded-information data, and finishes communicating with a hot spot.

9. A wireless-communication network system according to any one of Claims 6 to 8, wherein the communication network includes the Internet, an intranet, and a LAN.

10. A controller of a wireless-communication network system that is connected to an authentication terminal and a micro radio-base station and that passes on data between a mobile terminal and a communication network, the controller comprising:

a function of generating and/or deleting user-authentication data of the mobile terminal,

wherein the controller determines whether or not a utilization request transmitted from the authentication terminal is accepted, and transmits the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal, and

wherein when a user-authentication-data-reception completion notification is transmitted from the mobile terminal, the controller transmits a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal and performs processing for charging a user a utilization fee.

11. A controller of a wireless-communication network system that is connected to an authentication terminal and a micro radio base station and that passes on data between a mobile terminal and a communication network, the controller comprising:

a function of generating and/or deleting user-authentication data of the mobile terminal,

wherein the controller determines whether or not a utilization request transmitted from the authentication terminal is accepted, and transmits the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal,

wherein when a user-authentication-data-reception completion notification is transmitted from the mobile terminal, the controller transmits encoded-information data used for radio communication performed between the micro radio-base-station device and the mobile terminal to the mobile terminal, and

wherein when an encoded-information-reception-completion notification

is transmitted from the mobile terminal, the controller transmits a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal and performs processing for charging a user a utilization fee.

12. A communication-service-providing method used in a wireless-communication network system constructed between a mobile terminal and a micro radio-base-station device via a communication network, the communication-service-providing method comprising the steps of:

determining whether or not a utilization request transmitted from an authentication terminal connected to the micro radio-base-station device is accepted, and transmitting the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal;

transmitting a user-authentication-data-reception-completion notification to a controller connected to the micro radio-base-station device upon receiving the user-authentication data;

transmitting encoded-information data used for radio communication performed between the micro radio-base-station device and the mobile terminal upon receiving the user-authentication-data-reception-completion notification;

transmitting an encoded-information-reception-completion notification to the controller via the authentication terminal upon receiving the encoded-information data; and

receiving the encoded-information-reception-completion notification, transmitting a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal, and performing processing for charging a user a utilization fee.

13. The communication-service-providing method used in the wireless-communication network system according to Claim 12, the communication-service-providing method comprising the steps of:

- transmitting position-registration-request data including the user-authentication data and terminal information from the mobile terminal;

- comparing the user-authentication data and the terminal information that are included in the transmitted position-registration-request data with a database included in the controller;

- performing position registration and transmitting a position-registration-completion notification to the mobile terminal and the controller when the user-authentication data and the terminal information agree with the database, and

- starting the radio communication between the mobile terminal which received the position-registration-completion notification and the micro radio-base-station device.

14. The communication-service-providing method used in the wireless-communication network system according to Claim 13, further comprising the steps of:

- transmitting utilization-finish-request data from the mobile terminal to the controller;

- cancelling the registered position of the mobile terminal which received a utilization-finish notification transmitted from the controller;

- invalidating the user-authentication data and the encoded-information data;

- transmitting a utilization-finish-procedure-completion notification to the mobile terminal;

- performing processing for charging the user the utilization fee when the utilization fee is paid on time;

transmitting the utilization-finish-procedure-completion notification and utilization-fee-statement data to the mobile terminal; and

invalidating the user-authentication data and the encoded-information data, and finishing the communication after receiving the utilization-finish-procedure-completion notification.

15. The communication-service-providing method used in the wireless-communication network system according to any one of Claims 12 to 14, wherein the communication network includes the Internet, an intranet, and a LAN.

16. A program which makes a computer perform communication-service-providing processing in a wireless-communication network system constructed between a mobile terminal and a micro radio-base-station device via a communication network, the program comprising the steps of:

determining whether or not a utilization request transmitted from an authentication terminal connected to the micro radio-base-station device is accepted, and transmitting the user-authentication data when the utilization request is accepted, or a rejection notification when the utilization request is not accepted to the mobile terminal via the authentication terminal;

transmitting a user-authentication-data-reception-completion notification to a controller connected to the micro radio-base-station device upon receiving the user-authentication data;

transmitting encoded-information data used for radio communication performed between the micro radio-base-station device and the mobile terminal upon receiving the user-authentication-data-reception-completion notification;

transmitting encoded-information-reception-completion notification to the controller via the authentication terminal upon receiving the encoded-



information data; and

receiving the encoded-information-reception-completion notification, transmitting a user-registration-procedure-completion notification to the mobile terminal via the authentication terminal, and performing processing for charging a user a utilization fee.

17. The program according to Claim 16, further making the computer performs the steps of:

transmitting position-registration-request data including the user-authentication data and terminal information from the mobile terminal;

comparing the user-authentication data and the terminal information that are included in the transmitted position-registration-request data with a database included in the controller;

performing position registration and transmitting a position-registration-completion notification to the mobile terminal and the controller when the user-authentication data and the terminal information agree with the database, and

starting the radio communication between the mobile terminal which received the position-registration-completion notification and the micro radio-base-station device.

18. The program according to Claim 17, further making the computer performs the steps of:

transmitting utilization-finish-request data from the mobile terminal to the controller;

cancelling the registered position of the mobile terminal which received a utilization-finish notification transmitted from the controller;

invalidating the user-authentication data and the encoded-information data;

transmitting a utilization-finish-procedure-completion notification to the mobile terminal;

performing processing for charging the user the utilization fee when the utilization fee is paid on time;

transmitting the utilization-finish-procedure-completion notification and utilization-fee-statement data to the mobile terminal; and

invalidating the user-authentication data and the encoded-information data, and finishing the communication after receiving the utilization-finish-procedure-completion notification.

19. A computer-readable information-recording medium (including a compact disk, a flexible disk, a hard disk, a magneto-optical disk, a digital video disk, a magnetic tape, and a semiconductor memory) on which the program according to any one of Claims 16 to 18 is recorded.